

NOAA Ship RONALD H. BROWN



Introduction

The RONALD H. BROWN represents a major accomplishment in the National Oceanic and Atmospheric Administration's efforts to modernize its fleet of oceanographic research, fisheries research, and hydrographic charting vessels. Launched in May 1996 at the Halter Marine Group shipyard in Moss Point, Mississippi, the ship was sponsored by Mrs. Alma Brown, the widow of Commerce Secretary Ronald H. Brown who perished under tragic circumstances while in the service of his country.

The RONALD H. BROWN, with its capability of sampling both the oceans and the atmosphere, will provide a valuable tool for scientists to better understand and predict global climate changes on seasonal-to-interannual and decadal-to-centennial time scales. The ship has the speed, endurance, seakeeping capabilities, and state-of-the-art computer systems and scientific facilities required to meet NOAA's worldwide research and data collection needs. With its advanced meteorological/scientific radar system and upper air sampling system, RONALD H. BROWN is a unique vessel in the United States Oceanographic fleet.

The RONALD H. BROWN is the fourth of its class to be designed and built to commercial standards by Halter Marine, Inc. of Moss Point, Mississippi, under contracts administered by the Naval Sea Systems Command. The other three ships are assigned to the University of Washington, Scripps Institution of Oceanography, and Woods Hole Oceanographic Institution.

Additional information on the RONALD H. BROWN can be found on the ship's web page at <http://www.pmc.noaa.gov/rb/>. Inquiries can be directed to the ship via e-mail at noaa.ship.ronald-brown@noaa.gov.

Principal Characteristics

Propulsion Plant

Motors	— Two 3000 HP Propulsion
	General Electric Model CD6999
	— One 1,117 HP Bow Thruster
	General Electric Model CD6887
Diesel Generators	— Three Propulsion Service
	Caterpillar 3516TA, 1500 KW
	— Three Ship Service Power
	Caterpillar 3508TA, 715 KW
	— One Emergency
Propulsors	Caterpillar 3406TA, 250 KW
	Two 3000 HP Z-Drives
	Lips Type FS 2500-450/1510 BO
Switchgear	General Electric
Bow Thruster	One 1,180 HP Azimuthing Jet
	Type Elliot Gill Model 50 T 35
Dynamic Positioning System	Robertson RMP
	ROBPOS System

Accommodations 59

Dimensions

Length Overall	274 ft
Breadth	52.5 ft
Depth to Main Deck	26.5 ft
Draft	17.0 ft

Displacement

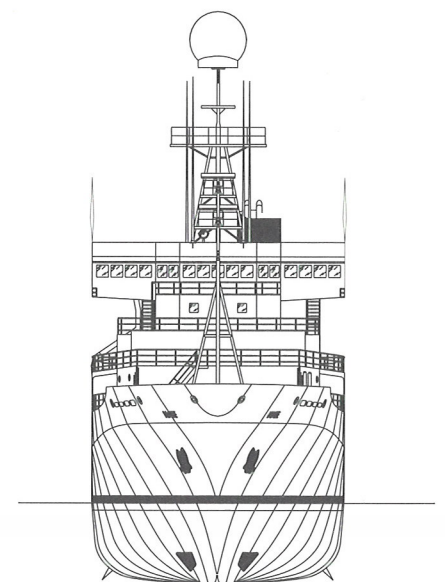
Full Load	3,250 T
Lightship	2,100 T

Underway Operations

Speed, Sustained	15.0 kts
Endurance	11,300 nm @ 12 kts (plus 30 days on station)

Certifications

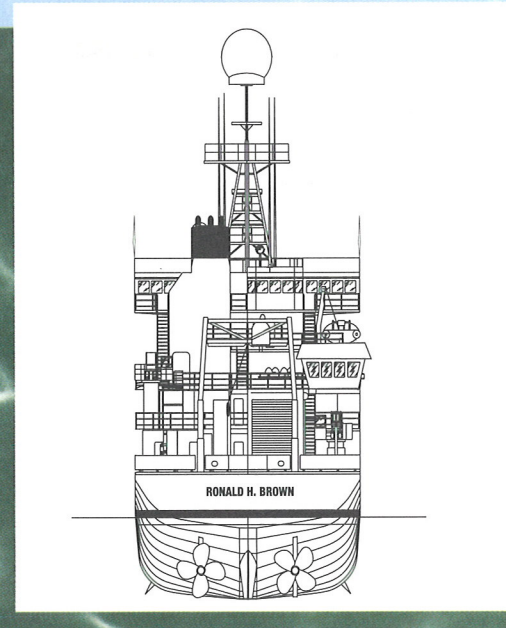
ABS	⚡A1Ⓜ, ⚡AMS, ⚡ACCU
USCG	Ice Class C Certification Oceanographic Research Vessel



Mission

NOAA's newest research vessel RONALD H. BROWN is a multi-purpose vessel equipped with a balanced mix of oceanographic and atmospheric observation capabilities. With its sophisticated state-of-the-art sampling equipment and shipboard scientific computer system (SCS), RONALD H. BROWN can collect data that will enable scientists to make critical near-term forecasts of global climate variability and predictions of climate changes on decadal-to-centennial time scales.

A Doppler radar system, characterized by a 12-foot diameter dome that sits atop the aftermast, provides NOAA its first opportunity to understand precipitation and storm dynamics over the ocean. A Seabeam sonar system provides support for exploration of undersea volcanic events and bathymetric mapping of the ocean floor. Typical missions of the RONALD H. BROWN will include oceanographic sampling of surface, midwater and ocean floor parameters; collection of meteorological data; towing scientific packages and remotely operated vehicles; shipboard data processing and sample analysis, and station keeping to support deep ocean mooring arrays.

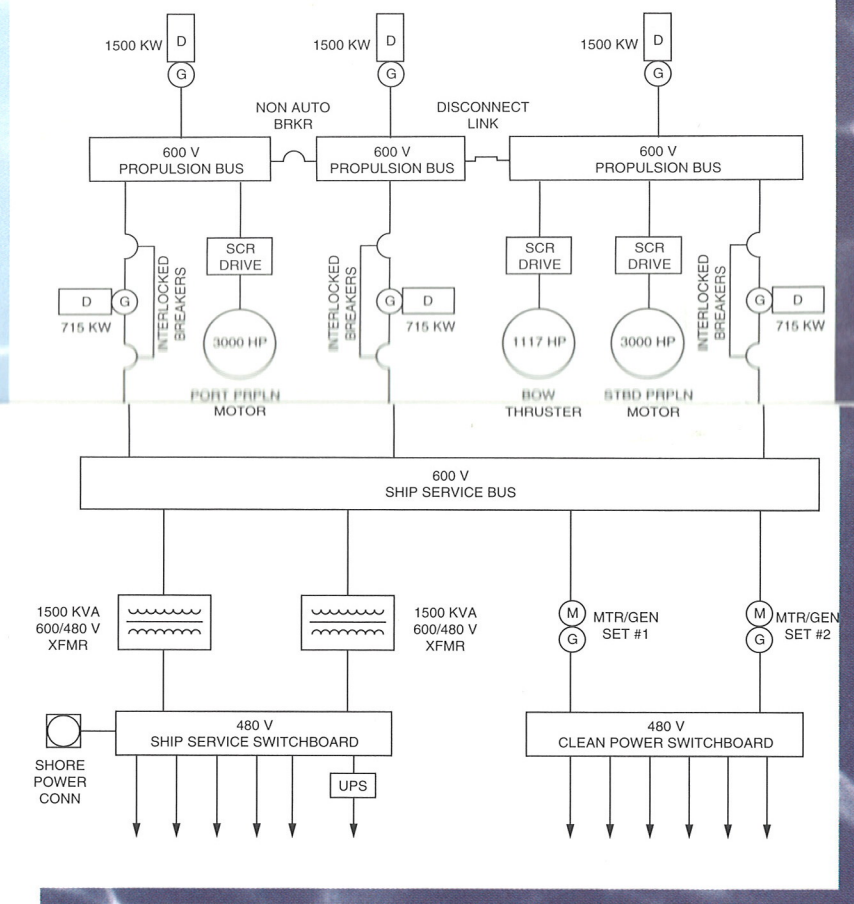


Ship Systems

Propulsion/Electrical Systems

The RONALD H. BROWN is designed with a split bus diesel electric propulsion system consisting of twin screw propellers driven through Z-drives. The Z-drives include gear reduction and 360 degree thrust direction control in a compact unit. Elimination of conventional reduction gears and long propeller shafts frees space for oceanographic uses. Complete thrust direction control provides unparalleled ship control and maneuverability to permit precise position keeping and track line following. Continuous variable control of ship speed can be maintained up to maximum speed. The Machinery Plant is designed for unattended operation. The electric propulsion and auxiliary machinery systems are controlled and monitored from the Main Control Station (MCS), located on the first platform.

The power generating system is designed to be highly flexible. Three 1500 KW and three 715 KW diesel generators provide power to the propulsion and ship service electrical systems. Clean power to laboratories, vans, and communication/navigation equipment, as well as to dynamic positioning, scientific information and machinery control systems is provided from the ship service electrical system by two motor generator sets.



Ship Control

The RONALD H. BROWN is driven and maneuvered by two omni-directional Z-drives and a rotating jet-type bow thruster. Ship controls are located in the Pilot House, Aft Control Station, and Electronic/Computer Lab. A Dynamic Positioning System (DPS) automatically controls the Z-Drives and bow thruster to provide automated precision trackline and station keeping capability. The DPS can use data input from a Global Positioning System (GPS), an acoustic position reference system, the gyrocompass and wind sensor systems.

Mission Systems

Handling Equipment

Cranes:

Two Telescopic Boom Cranes (Alaska Crane Model MCS 1565-NO)

- Lift capacity of 42,000 lbs.
- Assist in working deck operations including the handling of scientific equipment, material, and vans.
- Deploy dredge wire or EM cable from Traction Winch System (Main Deck Crane only).

Two Portable Foldable Boom Cranes (Morgan Marine Model 18000)

- Fully extended lift capacity of 2,205 lbs.
- Crane pedestals are designed to interface with the working deck bolt-down system to provide flexibility.

Winches:

Two hydrographic winches (Markey Type DESH-5)

- Line pull of 7,000 lbs at mid-scope with a capacity of 10,000 meters using .322 inch EM cable or 1/4 3x19 torque-balanced wire rope.

- Installed on the "02 Level" to support oceanographic operations using the starboard outside handling gear.

Dual Traction / Stowage Winch System (Markey DUTW-9-11)

- Capable of handling 30,000 ft. of 0.690 fiber optic cable or 30,000 ft. of 0.680" EM Cable; and 45,000 ft. of 9/16" 3x19 torque-balanced wire rope.
- Installed in the Winch Room below the working deck and to support over the stern operations in conjunction with the working deck crane and A-Frame.

Handling Gear:

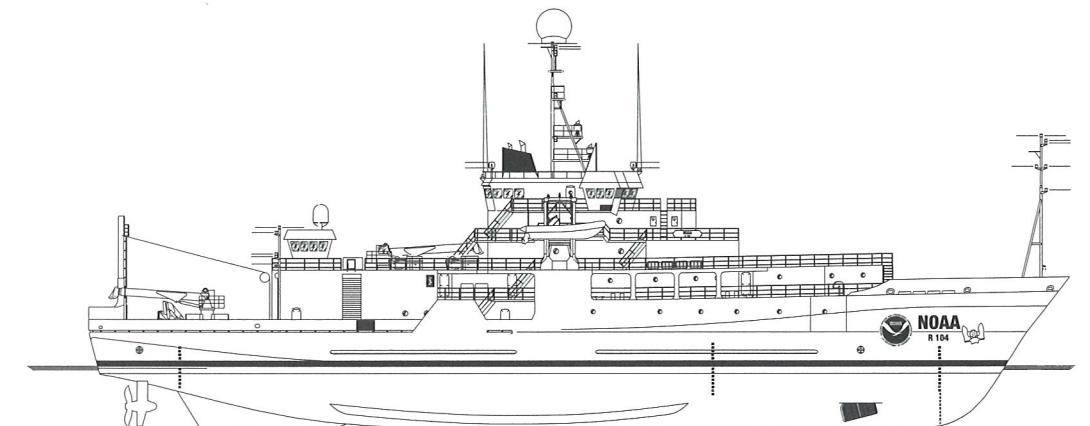
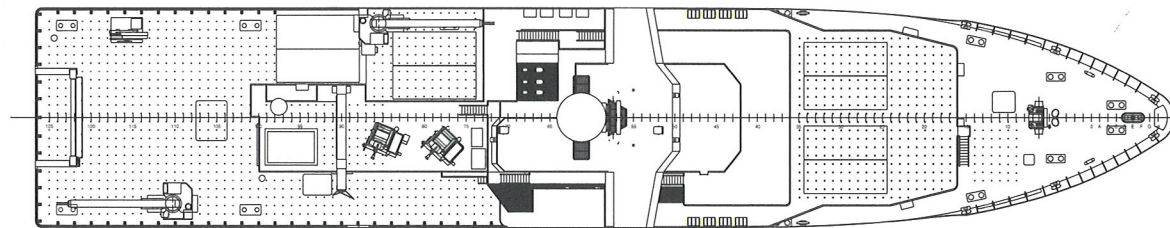
A-Frame (Fritz Culver FCDB-2-1337)

- Mounted on the stern to launch and recover oceanographic equipment and to support running cable from the traction winch system.

Hydrographic Boom (Allied Systems FTB-15-42)

- Installed on the 02 Level starboard side to

launch and recover oceanographic equipment and to support running cable from the hydrographic winches.



Mission Electronics

MULTIBEAM ECHO SOUNDING SYSTEM, SEABEAM 2112, is a 12 KHz swath sonar system capable of bathymetric mapping and seafloor feature studies in water depths ranging from 50 m to 11,000 m with up to 151 sonar beams. Swath coverage varies as a function of depth from 150 degrees at 1000 m, 120 degrees at 5000 m, and 90 degrees at 11,000 m.

HYDROGRAPHIC / SUB-BOTTOM PROFILER, Ocean Data Equipment Corporation (ODEC) Bathy 2000, is a flexible dual-frequency (3.5/12 KHz) system providing survey capability from shallow inland waterways to full ocean depth. The 12 KHz deep/shallow bottom profiler provides single beam depth data to 10,000 m for bottom profiling or for tracking acoustic pingers in the water column. The 3.5 KHz sub-bottom profiler uses an array of TR-109 transducers to provide shallow sub-bottom penetration with a 35 degree beam in water depths to 10,000 m.

DEPTH RECORDER/INDICATOR SYSTEM, Raytheon Model RD-500, is an 80 KHz chart recording fathometer that measures depths to 500 m. One unit is located in the Pilot House, and one is located in the Computer Lab.

ACOUSTIC DOPPLER CURRENT PROFILER, RD Instruments Model VM-150-18HP, is a 153.6 KHz system providing vertical profiles of ocean current speed and direction at depths up to 380 m.

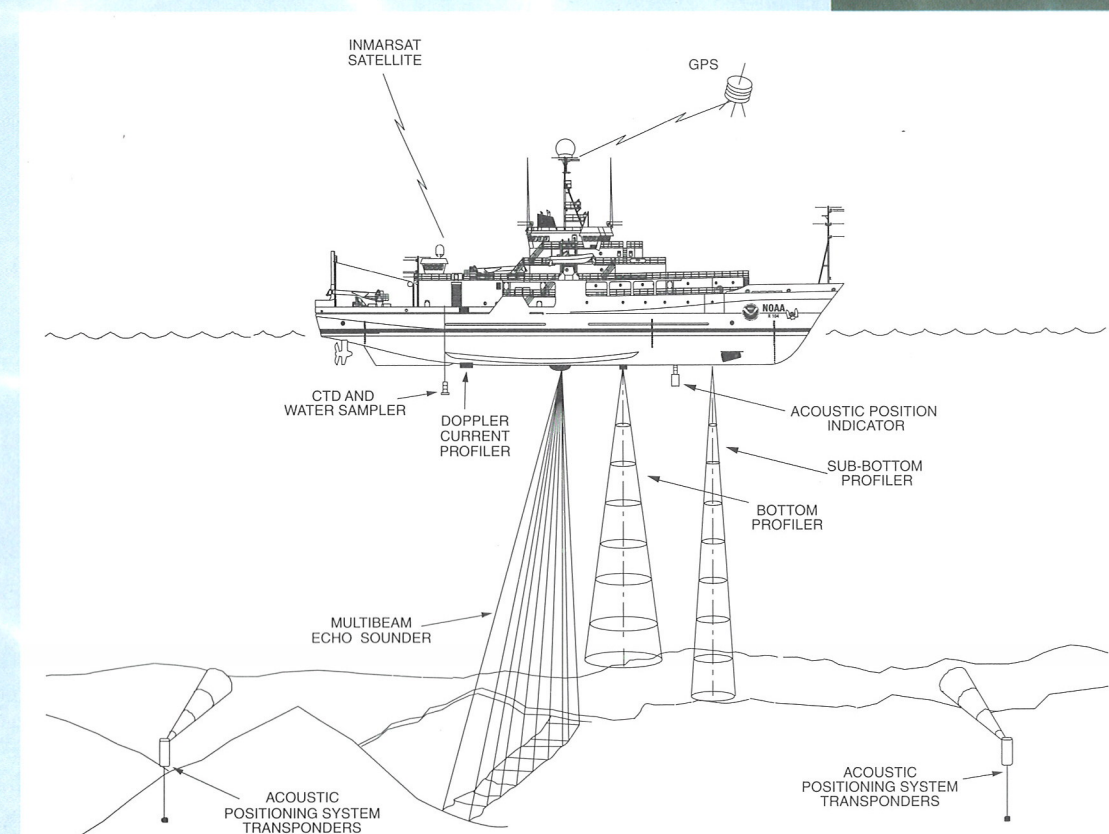
DOPPLER SPEED LOG, ODEC Model DSN-450, is a 200 KHz dual-axis, four beam system that provides accurate indications of ship's speed, distance traveled, and water depth. Ship's speed is referenced to the sea bottom in shallow water and to the surrounding water mass at deeper depths. This system provides speed input to numerous shipboard electronic systems including navigational radars, SEABEAM, Bathy 2000, Dynamic Positioning System, and MK-39 Attitude and Heading Reference System.

ACOUSTIC POSITIONING SYSTEM, Nautronix RS916, is an advanced Ultrashort / Long Baseline (USBL/LBL) acoustic positioning system that measures and displays the position of the vessel with respect to acoustic beacons moored on the sea floor or mounted on a submersible vehicle. In USBL mode, the system requires only one sub-sea beacon and one shipboard hydrophone to determine the position of the beacon relative to the vessel. In LBL mode, a minimum of three beacons and one hydrophone is required. Input from the system can also be provided to the Dynamic Positioning System as a means of relative positioning for precise steering.

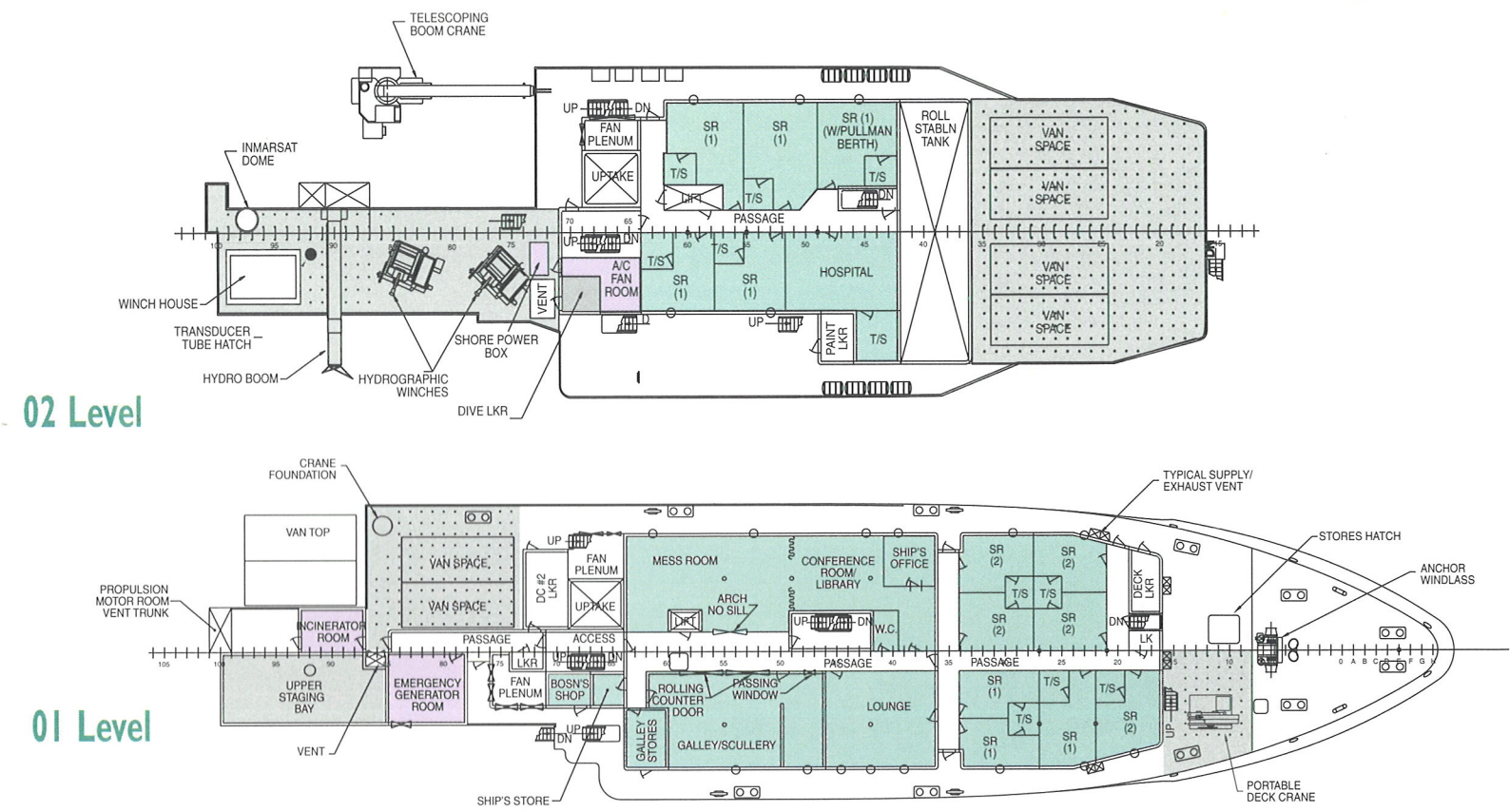
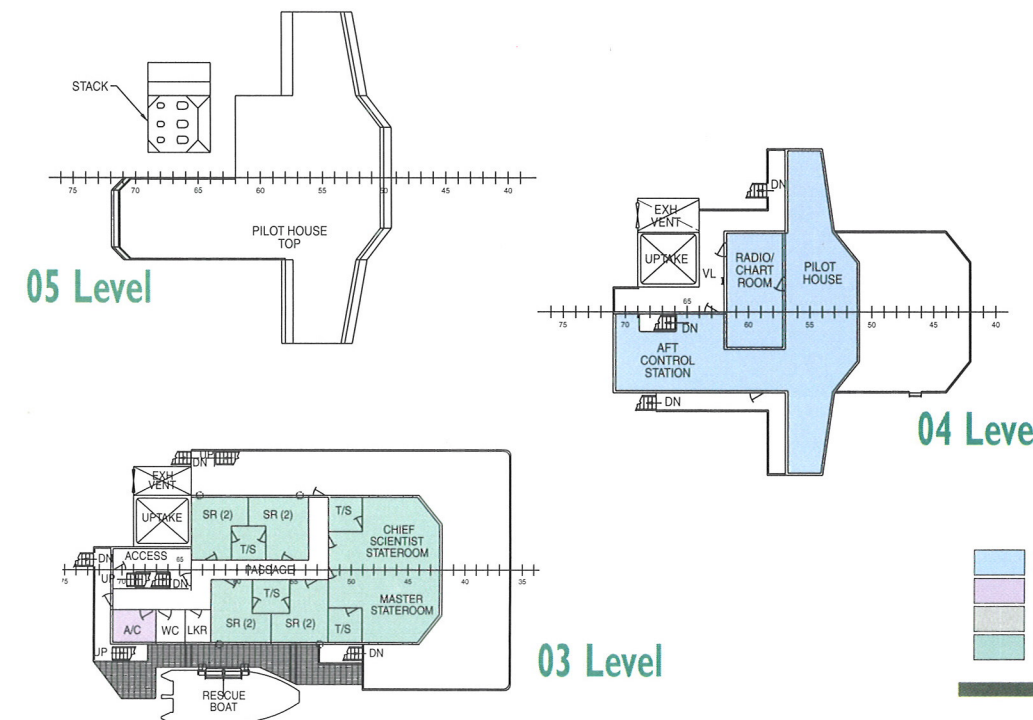
CONDUCTIVITY, TEMPERATURE, DEPTH (CTD) SYSTEM, Sea-Bird Model 911 plus, provides profiles of conductivity and temperature versus depth from the surface to 6800 m. The system is equipped with a 12-bottle rosette with Sea-Bird RS-232 tripping mechanism that allows for the collection of discrete water samples at various depths.

GLOBAL POSITIONING SYSTEM (GPS), is a worldwide satellite-based radio navigation system that can provide navigational, geodetic position, and velocity data in three dimensions. The multiple onboard systems have P-code or differential (DGPS) capabilities and are interfaced to the Dynamic Positioning System, the electronic chart display in the Pilot House, and the ship's Scientific Computer System.

SCIENTIFIC COMPUTER SYSTEM (SCS) is a computer-based data collection system that is interfaced with the ship's LAN. The system collects, stores, processes, and retrieves a variety of data from navigational, oceanographic, and meteorological sensors as well as other mission-related inputs. Data can be transmitted to other stations worldwide via satellite communication links. Shipboard capabilities include full e-mail functionality, both internally and to shore facilities.



General Arrangements



Accommodations/Habitability

The RONALD H. BROWN accommodates a total of 59 officers and crew. There are 9 single staterooms and 25 double staterooms. Officers, crew and scientists share common messing, lounge, recreation, and physical training facilities. The ship has a hospital space and a self-service laundry. Berthing and personnel support spaces are all forward, with the number of accommodations equally divided above and below the Main deck.

Mission Support

The Main Deck is used primarily for mission support. There is 3500 sq ft of open working deck space (9.5 ft above the water line) that includes a 12 ft x 90 ft unobstructed core sample lay down area on the starboard side. With the exception of HVAC services and some deck storage spaces, the deck is devoted to the mission. The enclosed spaces include a staging bay, offices, storerooms, laboratories, and other spaces that directly support the scientific mission of the ship. Two laboratory vans can be loaded on the port side with direct access to the ships interior. Additional spaces are allocated for vans on the 01 Level aft and on the 02 Level forward. Nearly 4000 sq ft is dedicated to laboratory space:

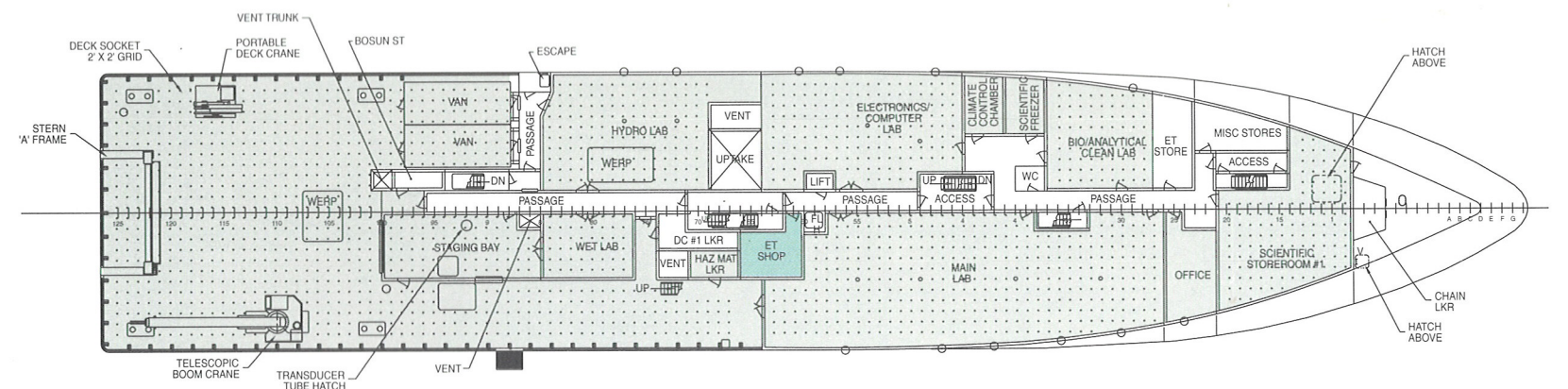
- Main Lab Area (1730 sq ft)
- Hydro Lab (700 sq ft)
- Electronics/Computer Lab (720 sq ft)
- Biochemical Lab (330 sq ft)
- Wet Lab (230 sq ft)

Additional scientific facilities include a hazardous material locker, a library/conference room, and a science office.

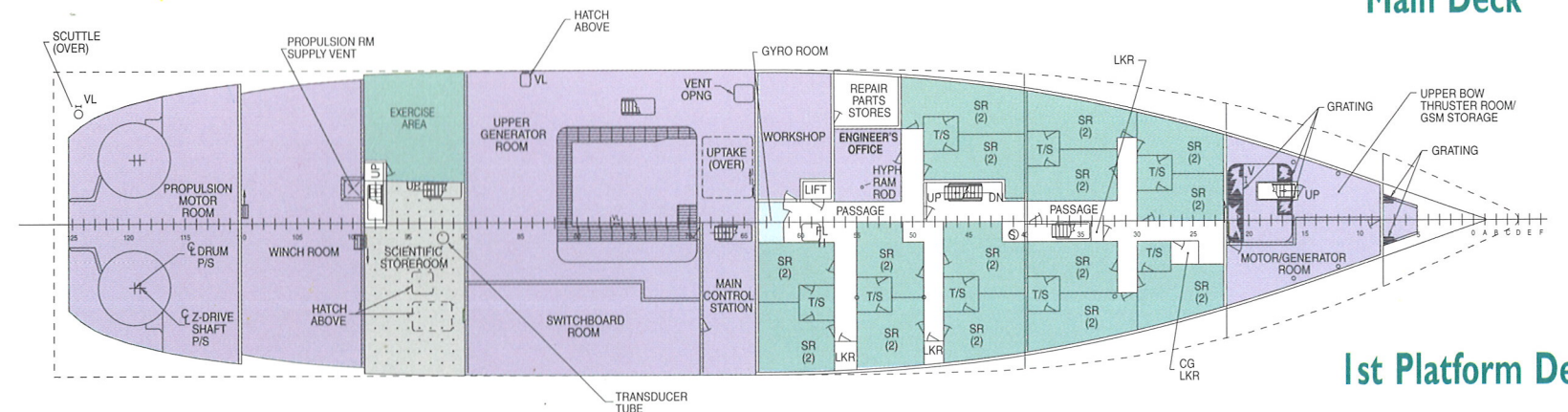
Scientific and laboratory spaces are maintained at 70-75° F with a maximum relative humidity of 55%.

Flush-deck bolt-down fittings and the use of Unistruts facilitate equipment rearrangement to support various missions.

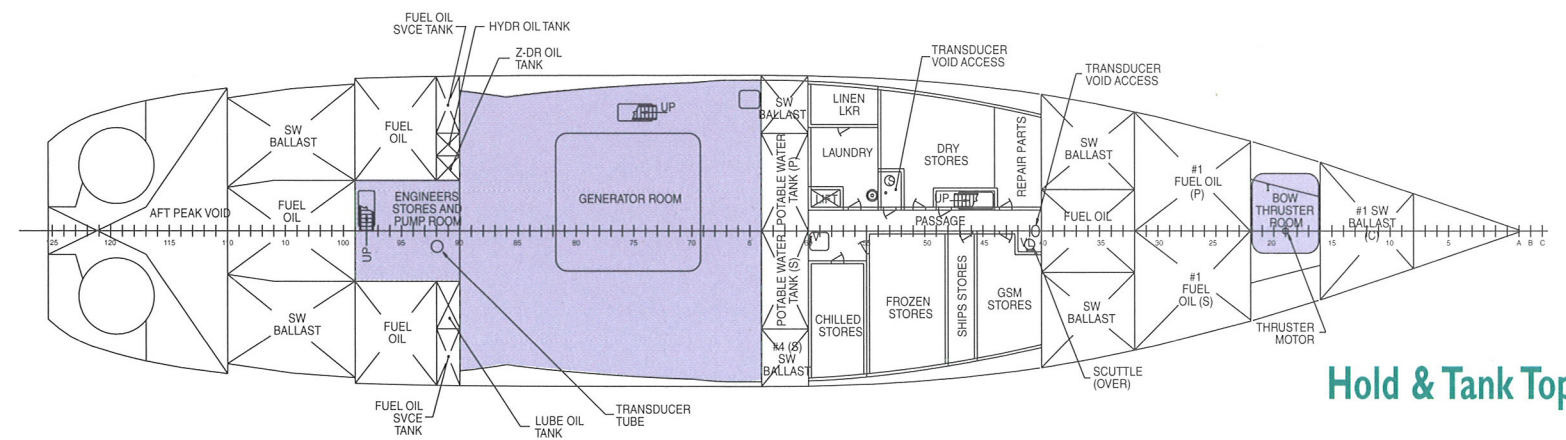
A transducer tube, 24-inches in diameter, is installed from Main Deck vertically through the bottom of the hull with the upper end accessible within the Staging Bay to permit deployment, testing, and use of special underwater instruments, transducer and hydrophone assemblies without drydocking. A bolted access in 02 Level deck directly above the tube permits handling and deployment of extra-long transducer/hydrophone or instrument packages.



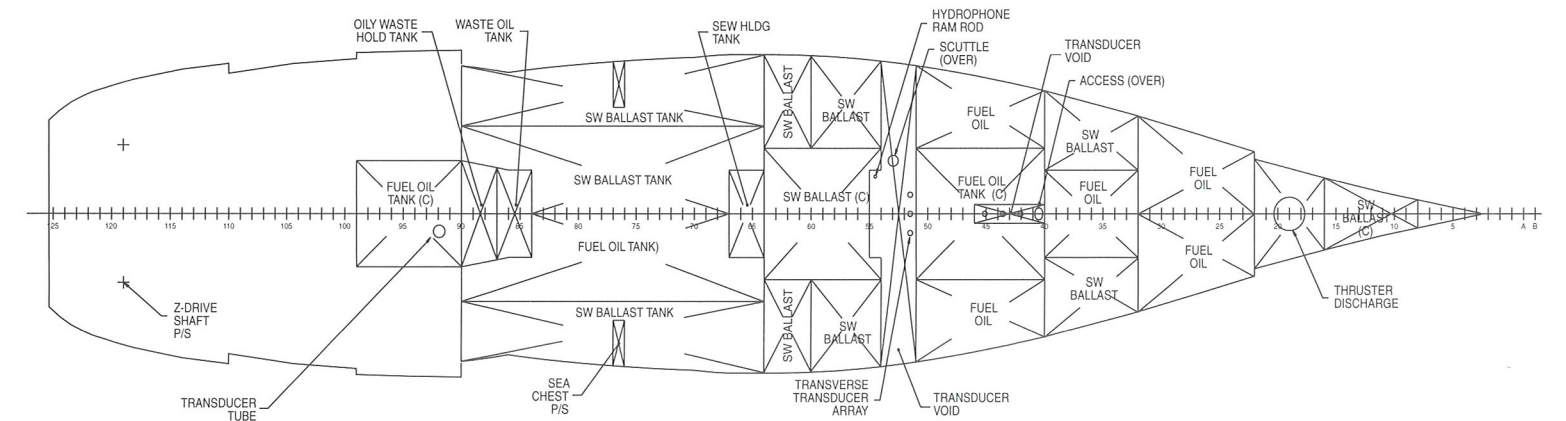
Main Deck



1st Platform Deck



Hold & Tank Top Plan



Double Bottom Plan



Picture to the left is the RONALD H. BROWN during mission tests of on-board scientific equipment enroute from the shipyard in Pasagoula, Mississippi, to NOAA's Atlantic Marine Center in Norfolk, Virginia

NOAA SHIP RONALD H. BROWN
ATLANTIC MARINE CENTER
439 W. YORK STREET
NORFOLK, VA 23510

NOAA